

PATENT CLAIMS

1. A pressure welding machine with a frame (10), two welding heads (13, 14), which are movable along a feed axis (41), and with two adjusting units (17, 18) with feed drives (23) for said welding heads (13, 14), **characterized in that** said two adjusting units (17, 18) are mounted axially
5 movably at the same frame (10) and are connected among one another to an adjusting drive (25) by means of a common adjusting element (26) and are supported.

2. A pressure welding machine in accordance with claim 1, **characterized in that** said adjusting element (26) is designed as a continuous spindle (27) with two threads (28, 29), which are directed in opposite directions and are connected to nuts (21, 22) at said adjusting units (17, 18).

10 3. A pressure welding machine in accordance with claim 1 or 2, **characterized in that** said threads (28, 29) are designed as motion threads, especially as ball or trapezoid threads.

4. A pressure welding machine in accordance with claim 1, 2 or 3, **characterized in that** said spindle (27) is arranged under said welding heads (13, 14) and said adjusting units (17, 18) in said machine bed (11).

15 5. A pressure welding machine in accordance with one of the above claims, **characterized in that** said adjusting drive (25) has a controllable motor (30), especially an electric motor, for driving said spindle (27).

6. A pressure welding machine in accordance with one of the above claims, **characterized in that** said frame (10) has a carriage guide (12) for the positive-locking mounting and guiding of travel carriages (14, 16, 19, 20) of the welding heads (13, 14) and said adjusting units (17, 18).

7. A pressure welding machine in accordance with one of the above claims, **characterized in that** said pressure welding machine (1) has a mobile central clamping device (5) for a central workpiece (2), which is mounted movably at said carriage guide (12) and guided between said welding heads (13, 14).

8. A pressure welding machine in accordance with one of the above claims, **characterized in that** said central clamping device (5) has two said spaced workpiece holders (6, 7), which have said holder carriages (8, 9) mounted movably at said carriage guide (12).

9. A pressure welding machine in accordance with one of the above claims, **characterized in that** said workpiece holders (6, 7) are connected to their said respective associated adjusting unit (17, 18) by a carriage adjuster (31, 32).

10. A pressure welding machine in accordance with one of the above claims, **characterized in that** said carriage adjusters (31, 32) have a carrier (33) and a spring (34) for relative evading motions at the connection point with said workpiece holder (6, 7).

11. A pressure welding machine, especially in accordance with one of the above claims, **characterized in that** said pressure welding machine (1) has a measuring means (35) for measuring

the true feeds and the pure workpiece shortening without elastic deformation.

12. A pressure welding machine in accordance with one of the above claims, **characterized in that** said measuring means (35) has at least one measuring unit (36, 37) arranged between a workpiece holder (6, 7) and said associated welding head (13, 14).

5 13. A pressure welding machine in accordance with one of the above claims, **characterized in that** said measuring unit (36, 37) has a scale (38) and a measuring head (39), which are arranged movably in relation to one another at said workpiece holder (6, 7) and at said associated welding head (13, 14).

10 14. A pressure welding machine in accordance with one of the above claims, **characterized in that** said measuring means (35) has a central measuring unit (40) between said workpiece holders (6, 7) and/or said welding heads (13, 14).

15 15. A pressure welding machine in accordance with one of the above claims, **characterized in that** said pressure welding machine (1) is designed as a friction welding machine or as a machine for welding with moving arc.

16. A method for pressure welding a plurality of said workpieces (2, 3, 4) along a, preferably common feed axis (41) by means of a pressure welding machine (1) with a frame (10), two said welding heads (13, 14) movable along a feed axis (41), and two said adjusting units (17, 18) with feed drives (23) for said welding heads (13, 14), **characterized in that** said outer workpieces (3, 4)

are moved relative to one another by said two adjusting units (17, 18) mounted axially (41) movably at said frame (10), wherein said adjusting units (17, 18) are mutually supported in an adjustable manner while absorbing the pressure welding forces in a closed system of forces.

5 17. A method in accordance with claim 16, **characterized in that** said adjusting units (17, 18) and a central clamping device (5) are positioned simultaneously and synchronously for a central workpiece (2).

18. A method in accordance with claim 16 or 17, **characterized in that** the true feeds and the workpiece shortenings are measured during pressure welding without the elastic deformations of said central workpiece (2) that occur during upsetting.